

Presentation to the Delta Stewardship Council

Richard Norgaard, Delta ISB Member

July 27, 2017

Review of Research On
The Sacramento-San Joaquin
Delta as an Evolving Place
a.k.a. DAP

Delta Independent Science Board



Chuck Bonham, Director of California's Department of Fish and Wildlife, argued that Delta policy makers and managers were sorely in need of a better public sense what the Delta as an evolving place means:

“How do you exactly define sense of place? I’m sure there’s an anthropological element, a psychological one, a sociological one, a historical one, and a geographical one. But I’m absolutely convinced that sense of place rests on passion. Some arrangement that’s a commitment to you to someplace that matters to you for some reason. We won’t do what needs to be done in the Delta in a void that lacks a sense of place. You may have it; most of Californians don’t, and that’s a problem.” (my underlining)

Keynote Speech, 13th Annual California Water Law Symposium
University of San Francisco January 21, 2017

Purpose of this Review

The Delta Reform Act of 2009 mandates that the coequal goals of water reliability and habitat restoration “shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place” (CA Water Code §85054).

The Act also directs the Delta Independent Science Board to review science programs in support of adaptive management in the Delta.

The Board conducted its review based on thematic areas, in this case we took a look at the science in support of Chapter 5 of the Delta Plan.

Why Values?

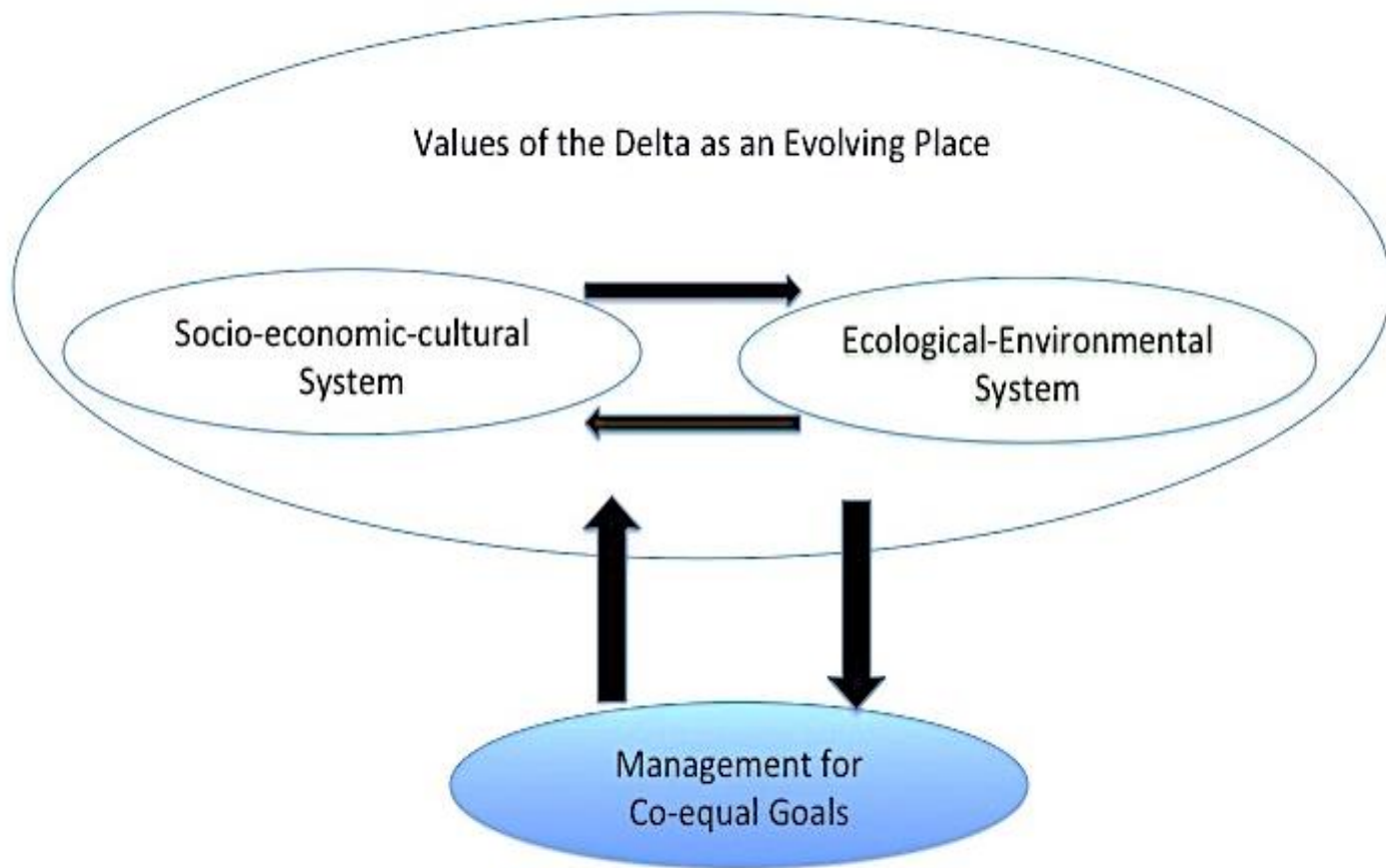
There was concern/confusion among ISB members and others as to why a science board would do a review of the values of the Delta as an evolving place... The simple response is that water reliability and ecological restoration protect and enhance values too. We need to understand the underlying processes that enhance the values of all of the goals and conditions, and that is science.

1. Policy, management, and implementation decisions based on the natural sciences alone can fall short of achieving their goals by failing to include input from the social sciences and the humanities.
2. The social sciences, including economics through which values can be estimated in monetary terms, are a part of science.
3. Researchers in the natural sciences need to pay attention to the processes of the Delta's terrestrial, hydrological, and biological environment that protect and could be used to enhance the unique values of the Delta as an evolving place.
4. Familiarity with Delta scholarship from the social sciences and humanities will help the Board, the Delta Science Program, and other agencies promote coupled human-natural systems research for understanding the Delta.
5. Delta scientists conduct research to support informed, rational decision-making for policy and management and their implementation. To that end, research effort should be directed to those areas where the lack of information and uncertainties are greatest.

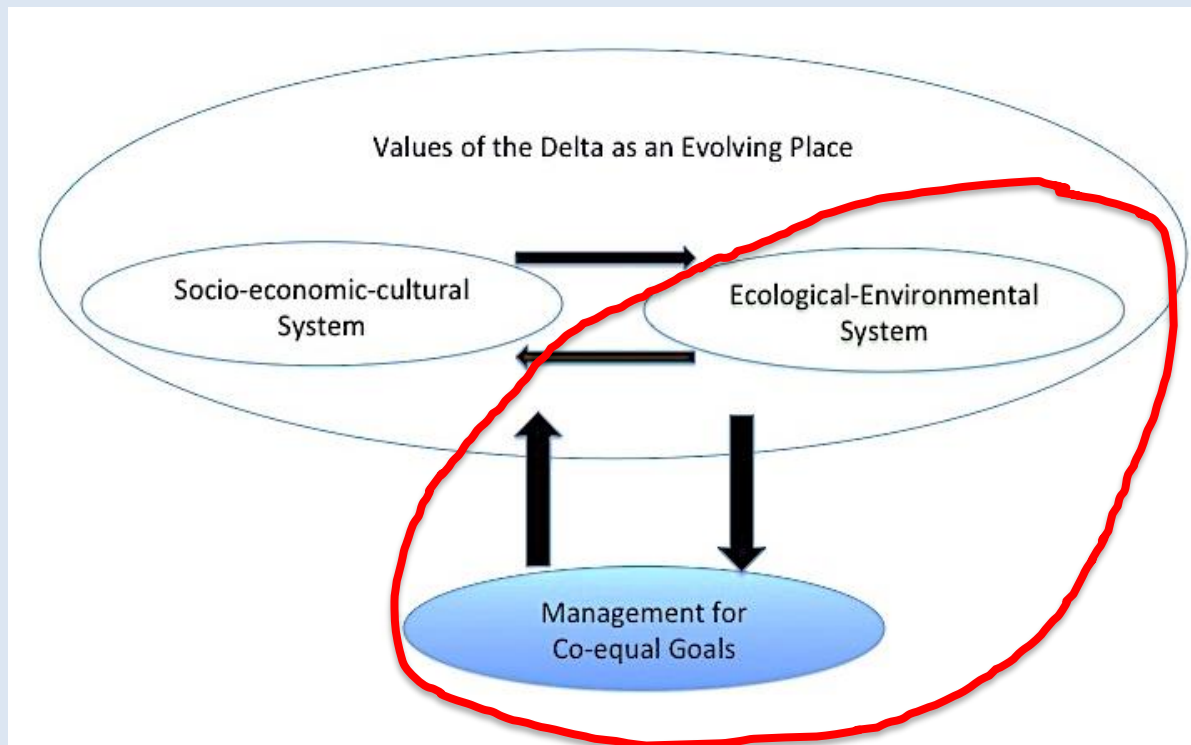
Methods – How we undertook this review

The Board initiated this review in July 2014. Board members searched for research papers and subgroups of the Board:

- Met with staff of the Delta Protection Commission (DPC) Executive Director Erik Vink and Senior Planner Blake Roberts.
- Met with Special Advisor Shakoora Azimi-Gaylon of the Delta Conservancy.
- Interviewed Prof. Robert Benedetti, professor emeritus at the University of Pacific and co-leader of the Delta Narratives Project, attended presentations of the Delta Narratives project, and participated in the project's final workshop.
- Engaged with Delta residents at meetings on the Delta Levees Investment Strategy.
- Met with Dr. Brett Milligan, assistant professor of landscape architecture in the Department of Human Ecology at UC Davis while he was undertaking research on uses of Delta restored and naturalized areas.
- Participated in the second meeting of the Delta Protection Commission's "Delta as Place Interagency Working Group."
- Spoke with the one agricultural extension specialist whose assignment is Delta-wide.
- Searched a database of graduate theses to ascertain whether any graduate student research projects on Delta as Place had remained below the radar of those with whom we had spoken about the topic.
- Participated in a meeting of UC Davis social scientists called to discuss how social scientists might be encouraged to work on Delta as Place through the Delta Science Program's Science Action Agenda.
- Visited the Dutra Dredging Museum in Rio Vista.
- The Board, as a whole, heard Prof. Benedetti, along with Erik Vink and Blake Roberts of the DPC on October 15, 2015 at the DISB meeting held in Knightsen.



Considerable frustration remains over what the Legislature might have meant by the “values of the Delta as an evolving place”. As our review unfolded, we interpreted “evolving” to mean how the socio-cultural system and the ecological-environmental system “select” on the the traits of the other.



Almost all Delta research now emphasizes the relationships between the Ecological-Environmental System and the Co-equal Goals (in the red “circle”). If the implications of these research findings were implemented, they would affect DAP. These research projects, however, rarely mention, let alone analyze, their connections to DAP.

This visualization elaborates on the text but is not actually in the text.

Literature Search

We searched for articles, dissertations, reports, book chapters, and projects that were undertaken in response to the 2009 Delta Reform Act or were undertaken since 2009 and independently contributed to an understanding of the interacting social and natural processes that make the Delta a valued place: culturally, recreationally, agriculturally, and with respect to its natural resources.

We found only seven such research projects that have some resemblance to our understanding of the concept.



1. Gambirazzio, Gerardo C. 2009. [The parallax view: Race, land and the politics of place -making in Locke, California](#). PhD dissertation, University of California, Davis.
2. Suddeth, R., J.F. Mount, and J.R. Lund. 2010. [Levee decisions and sustainability for the Sacramento San Joaquin Delta](#). *San Francisco Estuary and Watershed Science*, Volume 8, No. 2.
3. Whipple, AA, Grossinger, RM, Rankin, D, Stanford B, Askevold RA. 2012. [Sacramento-San Joaquin Delta Historical Ecology Investigation: Exploring Pattern and Process](#) (as well as earlier work by Michelle Stevens and Emilie Zelazo).
4. Smith, Natalie. 2013. [Sense of Place Impacts for Rural Residents in the Sacramento-San Joaquin River Delta](#). Masters paper in Environmental management at Duke University.
5. Multiple Participants. 2015. [Delta Narratives Project](#). Delta Protection Commission.
6. Milligan, Brett and Alexander Kraus-Polk. 2016. [Human Use of Restored and Naturalized Delta Landscapes](#). Departments of Human Ecology with funding from Water Resources Center. UC Davis.
7. Johnson, Michelaina. 2017. [Evading Dam-Nation: Land Use History of the Lower Cosumnes River Watershed](#). Senior Thesis in History. UC Berkeley.

1. This list is unusually short.
2. Many of the research projects were completed while this review was underway (and I interacted somewhat with the researchers.)
3. Yes, it is unusual to include a senior thesis among works of science, but:
 - a. it was very well done,
 - b. it is a very nice example of the sort of research needed, and
 - c. it used a combination of historical research and interviews of agency personnel and residents using both fixed questions and open follow up discussions.



Recommendations

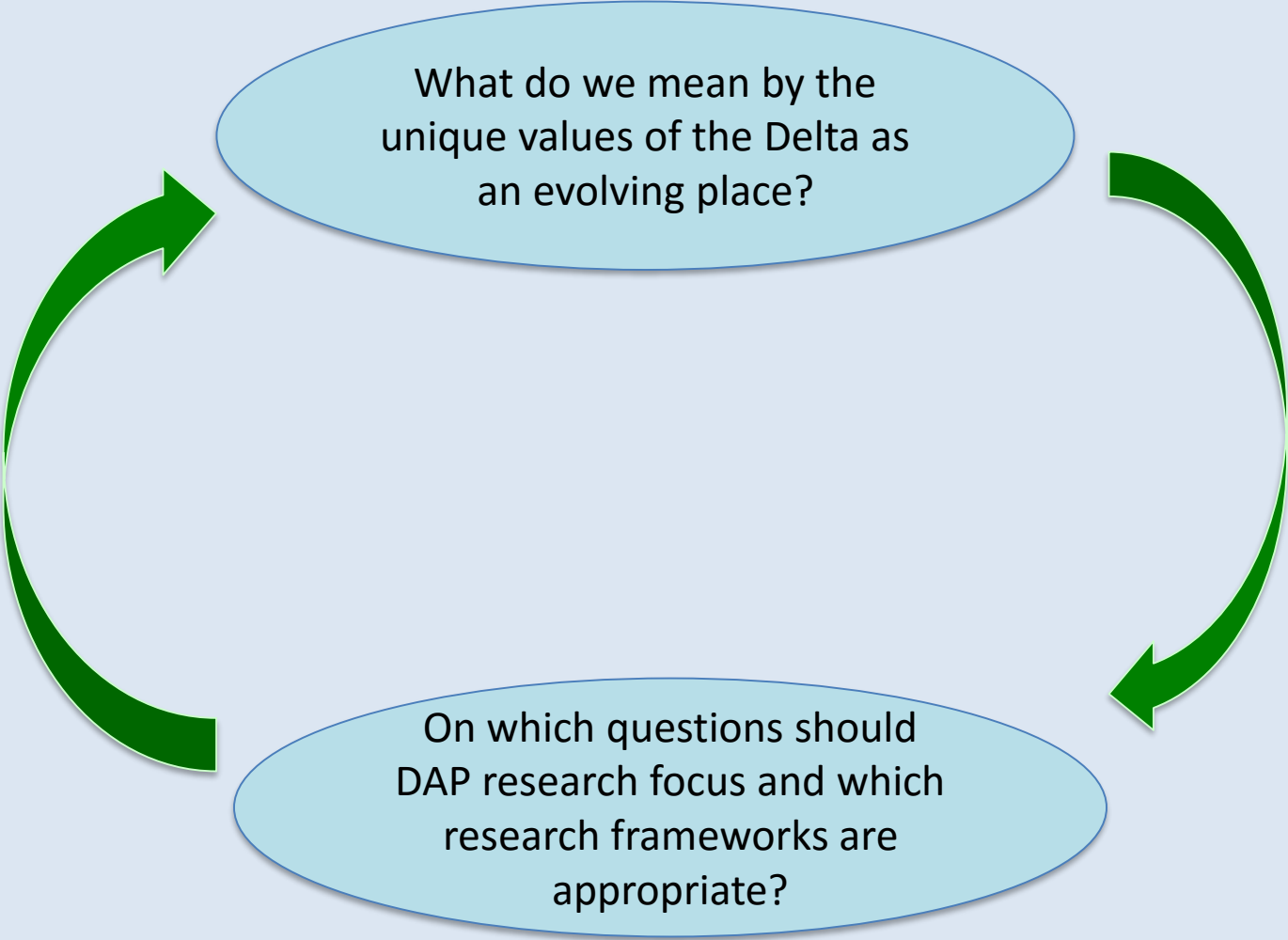
These 7 recent research efforts notwithstanding, decisions about human use of the Delta and its waters need far greater understanding of the social and natural processes that underlie the values of the Delta as an evolving place.

Accordingly,

We recommend establishing an ongoing research program on the Delta as an evolving place. We recommend that this area of research become substantial and integrated with Delta research in other areas such as flows, water quality, or at risk populations.

By research program we mean the organized accumulation of work by academics, nongovernmental research organizations, and agency researchers that contributes to a recognizable literature that informs subsequent research, responds to new developments, contributes to coherent usable knowledge, and informs policy and management decision-making. Such a research area needs to evolve through the efforts of multiple funders and individual researchers and build to a coherent whole through further reviews over time.

As in other research efforts, the understanding of what DAP is about will unfold over time. Through ongoing research, our understanding should become clearer and richer.



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What do we mean by the
unique values of the Delta as
an evolving place?

On which questions should
DAP research focus and which
research frameworks are
appropriate?

There are ongoing plans and strategies where DAP research clearly could provide useful input as they are updated:

- Delta Economic Sustainability Plan
- Delta Levees Investment Strategy
- Delta Plan itself



We made some research program suggestions

1. The number of social scientists doing research on the Delta as an evolving place needs to be increased significantly to help balance research on the Delta environment.
2. Researchers in the humanities can contribute more to cultural and historical knowledge and the understanding of the Delta's cultural, recreational, natural resource, and agricultural values. The Delta Narratives Project provides an excellent example with respect to cultural values.
3. Natural scientists currently researching Delta ecological questions can expand their work to help identify natural processes that protect and could be manipulated to enhance the values of the Delta as an evolving place. In some cases, existing research findings may simply need to be interpreted with respect to how they relate to Delta values.
4. Coupled human-natural systems research can contribute to a systemic and dynamic understanding of the Delta as an evolving place. Research frameworks that incorporate feedbacks between human and natural systems are key to understanding the Anthropocene.
5. Citizen-science should be explored and expanded for identifying, monitoring, and valuing unique Delta qualities. Residents can assist in envisioning and assessing alternative Delta futures.
6. Research involving Native Californians who have lived in and/or used the Delta is critical for understanding the Delta's environmental and cultural history. Traditional Ecological Knowledge has much to contribute to our understanding of sustainability and possible Delta futures.

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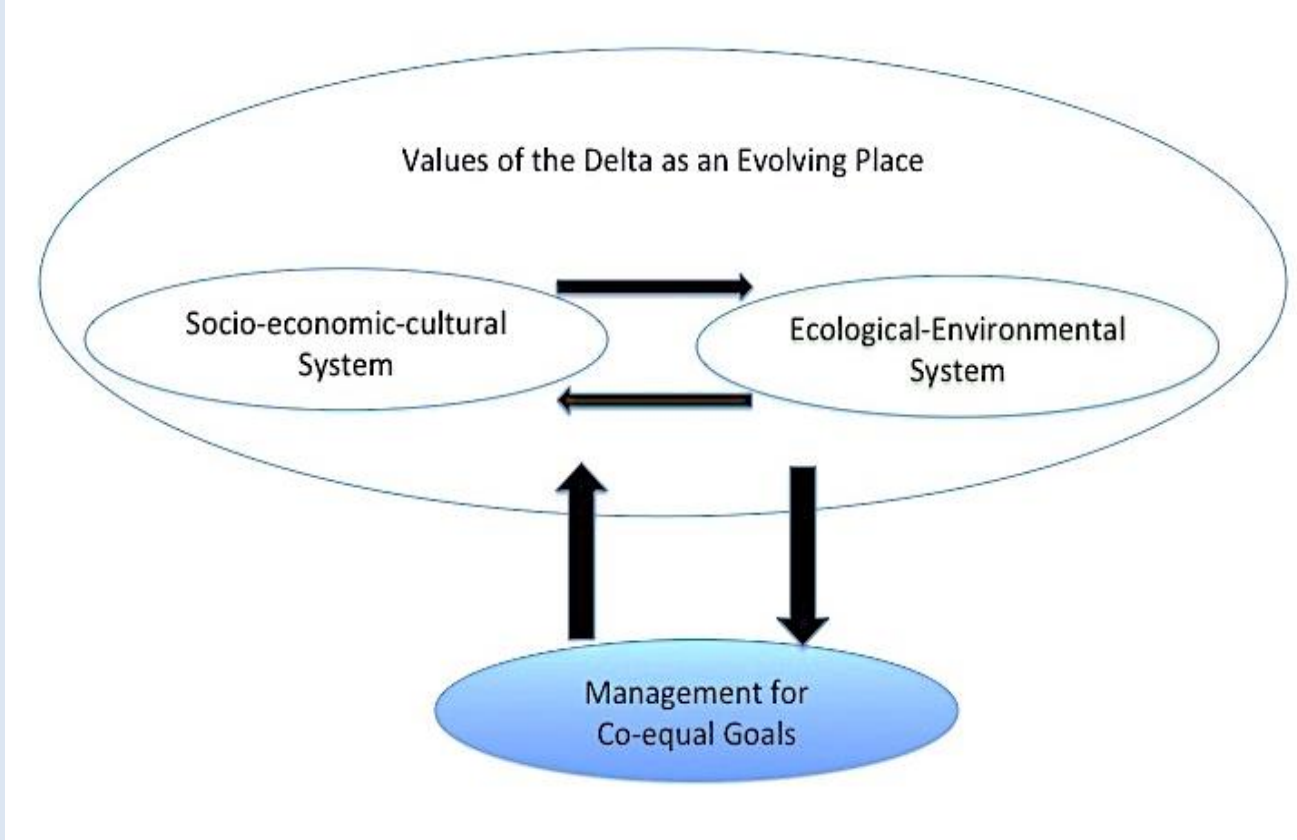
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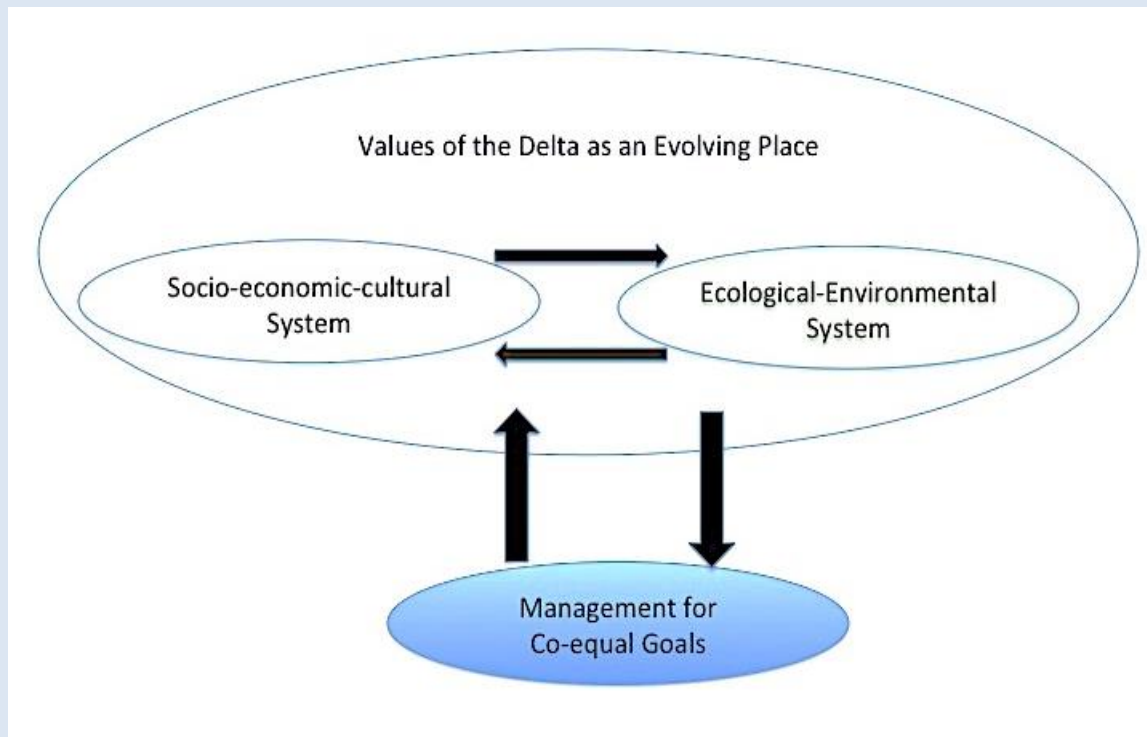
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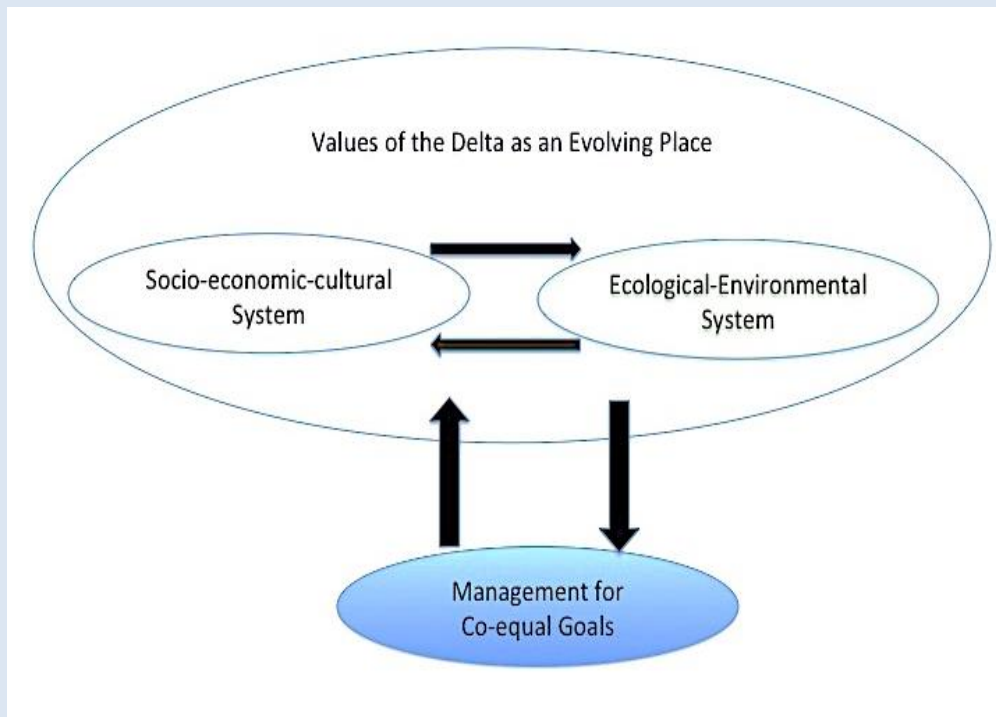
This is but one of many possible representations of the values of the Delta as an evolving place. Note that the arrows represent / suggest both cause and effect relationships as well as selective pressures that affect which “traits are becoming more or less dominant in accordance with how successfully they are sustaining/reproducing themselves.

This elaboration goes beyond the text, but not, in my judgment, the spirit, of the DISB review.



“Values” are the desirable features of the evolving process. Since we are also interested in avoiding undesirable features of that evolving process, from a scientific as well as policy and management perspective, “all” of the features of that evolving process that affect values are important (and at least as scientists, we do not need to distinguish between those that are desirable and those that are not).

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A Conundrum: What is to be protected and enhanced in an evolving system? Characteristics – No, for they evolve. Processes evolve also. Unique Values?

“The (Delta) Plan also seeks to protect and enhance the unique characteristics of the Delta as an evolving place.”

Conclusion

Little has been established about the unique values of the Sacramento-San Joaquin Delta as an evolving place and the social and the environmental processes supporting those values. Research in this area is sorely needed if those values are to be protected and enhanced as decisions are made to meet the co-equal goals of reliable water supplies and restored ecosystems.



Acknowledgments

The staff of the Delta Science Program provided critical assistance. Joanne Vinton provided an early bibliographic search that uncovered key documents including the graduate thesis by Natalie Smith. Delta Science Fellow Jahnava Duryea joined several early field trips and helped in the early stages. Science Fellow Annie Adelson helped with the final manuscript. Robert Benedetti provided early insights and an interesting presentation to the Board. We especially appreciate the cooperation of agency personnel, especially Erik Vink and Blake Roberts of the Delta Protection Commission.





Thank You